

STATINTL

January 22, 1964

(Potential Contract)

High Resolution Screen

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A demonstration of a high resolution screen was given for [redacted] and me on Jan 8 at the [redacted]

[redacted] is the parent company of [redacted]. Evidently they have been doing some lab work in anticipation of the potential contract. We observed over 100 lines per mm on the screen itself. Previously, we had been able to see about 60 lines per mm. They are using a small sample of a few square inches for this work. Going to a larger screen size is a matter of developing coating techniques.

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[redacted] remarked that, since present screens are adequate, there appeared to be no immediate application for this work. That was a surprise to me. I was under the impression that the limiting resolution of present screens was a definite limitation on high acuity presentations. I thought the exploratory work by [redacted] Systems and [redacted] was aimed directly at this problem.

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Even so, Bill has a point and he has led me to re-examine the merits of the case. If the eye can only see 6 to 10 lines per mm, why have a screen that will do 100 lines per mm. If you want more detail, don't worry about the screen, just use a higher magnification projection lens.

The object of projection viewing however is to present the interpreter with good ground scale so he can see detail and also with a large area of the ground so he can keep oriented. With 70mm film, this turns out to be about 8X to 10X enlargement, which fills the screen with the full film width. With a high resolution screen the interpreter can run film through at his best magnification and sit back to take in the whole screen area at one time. If there is detail of interest, he can move in with a hand glass of say 8X to examine it. If it is of passing interest, he can move back without interrupting his continuity. Thus a high projection screen gives him easy flexibility and introduces some of the advantages of microscope viewing, because he can easily get enlargements of 60X to 80X.

There is another important advantage in the wide viewing angle afforded by the new screen material. Conventional screens have a highly directional effect in their brightness. So much so that they often appear to have a hot spot where the direct rays hit the eye. [] phosphor screens however are uniformly bright over very wide angles of view. Since the visible light is generated at the screen surface and radiates in all directions, it closely approximates a Lambertian screen.

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I don't mean to indicate that there are no problems. This is a new area and there are some unknowns which is why an investigative type program was proposed.

The brightness that can be achieved can not be accurately predicted without experimental work. It was originally thought that a fundamental trade off between resolution and brightness would be a significant limitation but it now appears that this is not the case. [] presently thinks he will need a 5 KW mercury lamp to get enough ultraviolet light for a bright presentation. This can only be determined by experiment.

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The color of the visible image on the screen is controlled by the type of phosphor used. To date, [] has only done a small amount of work in anticipation of a contract and they have only used a blue phosphor. Blue, while easy to work with as a phosphor, is not a very good color to view but there are many other colors available.

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The proposed work on high resolution screens will not solve all the problems of projection viewing. It will not tackle zoom enlarging, high magnification projection, or new approaches to cooling film in the film gate. They will only utilize existing technology as it is applicable.

January 28, 1964

There has been some progress toward initiation of the work. [] briefed [] last week. [] is due there next Thursday for some technical negotiations.

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